

Prime Factors!

ALL numbers except for 1, can be written as a product (answer for multiplication) of two different factors...

Ex. $6 = 2 \times 3, 1 \times 6$

$24 = 1 \times 24, 2 \times 12, 3 \times 8, 4 \times 6$

Find all pairs of factors for 36

Answer: $1 \times 36, 2 \times 18, 3 \times 12, 4 \times 9$

What about instead of a pair of factors, you wanted to find a triple, or quadruple?
(P.S. Who WOULDN'T?)

Use one of the pairs you found already...I'll use 2×18 -You could choose any pair...

$$\begin{array}{c}
 \swarrow \downarrow \searrow \\
 2 \times 3 \times 6 = 36 \\
 \downarrow \downarrow \downarrow \downarrow \searrow \\
 2 \times 3 \times 2 \times 3 = 36 \\
 2^2 \times 3^2 = 36
 \end{array}$$

In fact, I could keep going
from there, because $6 = 2 \times 3$

I can't go any farther, because 2 and 3 are PRIME numbers.

They cannot be divided evenly by any numbers other than themselves or 1.

That means that $2 \times 3 \times 2 \times 3$ is the PRIME FACTORIZATION of 36. 2 and 3 are the prime factors of 36.

To clean it up, we write the numbers together - $2 \times 2 \times 3 \times 3$
 To clean it up even more, we write it as powers $2^2 \times 3^2$
 Therefore the prime factorization of 36 is $2^2 \times 3^2$

Another way to find the prime factors, is to continually divide by the LOWEST PRIME FACTOR that will go into a number. These are usually 2,3,5.

Find the Prime Factors of 60

These
are the
Prime Factors

Keep dividing by 2 until the quotient is an odd number

15 is odd. Try 3 since 2 will not work.

5 isn't divisible by 3, try 5.

Quotient is 1. We're done!

Therefore the prime factors of 60 are $2^2 \times 3 \times 5$

Homework.

Textbook pg 17

1a-d, 2, 3,



Write each product as a number in standard form:

a) $2^2 \times 3^2$

b) $7^2 \times 2^3$

c) $5^2 \times 3^3$

d) $2^2 \times 3^2 \times 5$

List the prime factors of each number (when listing and not putting as a product, you do not need to list the same number more than once):

- a) 21 b) 14 c) 100 d) 125
e) 19 f) 50 g) 77 h) 96

Write each number as a product of prime factors. Use exponents where possible.

- | | | | |
|--------|-------|--------|-------|
| a) 48 | b) 63 | c) 400 | d) 16 |
| e) 120 | f) 55 | g) 36 | h) 88 |